Longitudinal Case Study of the changing Characteristics of Student Entrepreneurs Participating in SPEED Plus at Coventry University

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Objectives

Student Entrepreneurship is a growing field with a high number of institutions globally, aiming to enhance their student's skills and opportunities. This research has been designed to measure the change in entrepreneurial characteristics within students engaged in Coventry University's Start Up programme (SPEED-Plus). Focusing on trait theory (Gudeon, 2008), a further enhanced research methodology to measure traits is to be developed.

Prior Work

Added value to student experience throughout their university careers has been considered essential by "The Wilson Review" (2012), with a focus upon placements, internships and work-based programmes. The SPEED-Plus programme was established in 2006 in order to provide an innovative, action-learning based route for students to develop their own businesses (Rae 2012). The value of SPEED-Plus has been noted in other studies including Woodier (2006, 2007) highlighting the positive impact gained by students on the programme, as well to "identify, nurture and convert potential and existing entrepreneurial spirit into business reality" (Birch and Clements, 2006). The importance of entrepreneurship was also stated in the BIS (2013) review of Enterprise Impact in HE and FE where "engaging young people in activities which help increase awareness of entrepreneurship are vital to increasing those actively starting a business" (BIS, 2013:13).

Approach

Utilising a 33 forced Likert scale question survey, which has its foundations in the work of Gasse (2000); 11 separate key characteristics discussed within the Trait Theory were measured at the beginning and end of the placement. These characteristics include, Locus of Control (Rotter, 1966), Self Efficacy (Gurol and Atsan 2006), Tolerance to Ambiguity (Jonassen & Grabowski, 1993) and Need for Achievement (McCelland, 1961); amongst others. Building upon the initial pilot of this study, 17 students undertook both the entrance and exit surveys to provide comparison.

Results

Following the initial pilot of this work in 2013, students were seen to have an increased level of all characteristics over the programme period. From preliminary evaluation of the results, there is a further indication that students engaged in the SPEED-Plus programme have continued this trend.

Implications

Projects like SPEED-Plus across HEI's around the world, can be assisted by this work through developing improved methodologies of recognizing their effectiveness, not only from a jobs/business created, but also from a longer term personality perspective.

Value

The value within this research lies in highlighting the importance of students taking that next step beyond the classroom to actually take their knowledge and apply it within their own business ventures.

Introduction

Programmes to support entrepreneurs within Higher Education are being implemented across the world, providing assistance in the form of loans, grants, training/education and office space. Often at the completion of these projects, success is measured upon whether a business has been created and how many jobs and businesses have been spawned to support the local economy. This however does not take into account the way in which the psychological and entrepreneurial characteristics of participants have changed over the course of the project.

This therefore has led to this study into measuring the changing entrepreneurial characteristics of students that are taking part in the SPEED Plus (Student Placement for Entrepreneurs in Education) project at Coventry University.

In order to measure the varying entrepreneurial characteristics of the participants a validated research survey has been developed that can reliably test and retest respondents in order provide comparison of the characteristics changing over the course of a six month placement. Through this process, the impact of the support provided to the participants were also measured so the continuous improvement can take place for future years.

Literature Review

Kelly et al. (2012) cited BIS (2001), BERR (2008) and European Commission (2006, 2008), that Graduate Entrepreneurship in the UK and Europe is a vital source of competitiveness and a possible stimulus for economic growth and development. The BIS (2013) review of Enterprise Impact in HE and FE highlighted that entrepreneurs make a considerable contribution to the UK economy as they drive efficiency, innovate by creating new products and methods, and create jobs and wealth (BIS, 2013:12). The importance of entrepreneurship education was also stated in the BIS (2013) review where "engaging young people in activities which help increase awareness of entrepreneurship are vital to increasing those actively starting a business" (BIS, 2013:13). The Government (BIS, 2013:13) has clearly committed to fostering an entrepreneurial culture as part of its strategy for future growth, and Culkin cited Gibb and Hannon (2006) that the "Higher Education sector has a vital role to play in the development of entrepreneurial talent and opportunities" (Culkin, 2013:636). Culkin claimed that the investment in which the UK Government has provided to support enterprise related activities in 2010 with the investment of over £850 million (Culkin 2013:636).

The Global Entrepreneurship Monitor 2013 UK report (2014:17) investigated the entrepreneurial activity of individual in over 70 countries, with 11,017 UK adults aged between 16 and 80 participated as part of the study. The 2013 report reported a significant decrease in the entrepreneurship metrics from a record 2012 year which included the Total Early-stage Entrepreneurship Activity (TEA), (Nascent plus New entrepreneur), to be down to under 6% from the previous high of 8% in 2012 for 18-24 year olds. The GEM (2014:4) study also stated that one fifth of the working age individuals were engaged entrepreneurial activities or intended to start a business within the next three years however this was down from 25%, although it is still higher than the historical trend to 2010 (GEM, 2013:4).

The HE-BCI survey produced by HEFCE (2012) for 2011 was cited by Culkin (2013:5) and highlighted that there were 2848 graduate start-ups within university business/enterprise support which was an increase from 2357 in 2010. The HEFCE (2013) survey also saw an increase to over 3,500 graduate starts up created within the year which obtains its information from 161 HEIs (HESA, 2013). This data however contradicts the general decline which was highlighted in the data comparison from the GEM 2013 report. Culkin (2013) also cited Rothaermel and Thursby (2005) that if the student graduate start-ups are a success, incubator facilities must sit within the context of a coherent programme of curricula and extra-curricular entrepreneurial learning, which provide a pipelines of students and graduates into the incubator facility (Rothaermel and Thursby, 2005).

In reviewing the importance of entrepreneurial education programmes, Rae (2009) stated that Entrepreneurial Action Learning should be part of universities education, as it provides an option of creating their own business venture or enhanced employment prospects. Action Learning according to Edmonstone (2003) is to tackle real problems or issues in order to get things done; reflecting and learning from their experience and from each other as they attempt to change things (Edmonstone, 2003). From Atherstone's view point Action Learning is a form of Problem Based Learning (PBL) however it goes further as the problems are real, no-one knows the answer (Atherstone, 2014). The above definitions can directly relate to the Business start-up process as no guaranteed outcome is given.

The need for Action Learning was also supported by the Wilson review (2012) as an increase need of opportunities for students to acquire relevant work experience during their studies, through placements, internships and work-based programmes. The 'Enterprise for All' (2014) report written by Lord Young also agreed with the previously research from Rae (2009) and Wilson (2012), where HEI's need to have access to enterprise and entrepreneurship education (Young, 2014). The review further stated that Universities holding the Small Business Charter status should have business start-up programmes as well (Young, 2014). The Small business Charter was recommended by Lord Young (2013:4) in his report entitled 'Growing Your Business' where he stated that business schools should have a greater role within the local economy to help business start up and for SMEs growth.

The recommendation from the Young (2014) report regarding the implementation of start-up programmes is not new to some HEI' as programmes such as SPEED, Grads Up North and Enterprise Inc. to name a few have been going for several years. The Student Placement for Entrepreneurs in Education (SPEED) has been running since 2006 and Woodier (2010), cited Birch and Clements (2006) that the "purpose of SPEED is to identify, nurture and convert potential and existing entrepreneurial spirit into business reality". The first SPEED programme was funded through HEFCE (HEIF round 3) and initially was a consortium of 13 Higher Education Institutes that ran between 2006 and 2008, however several successor projects were development including SPEED WM, and the current SPEED Plus (Rae, 2009:2).

Woodier (2010), through her longitudinal research of SPEED students at Derby University, highlighted that one of the main motivations for applying for SPEED was for funding and support which came with the scheme, and the students had a "give it a go" attitude. The students who started a business demonstrated more confidence, self-belief, business understanding and self-awareness through the process and therefore have a positive impact (Woodier 2006). She also mentioned that the students who did not start a business showed less positive results as they were unclear about their future in business because of the their experience.

According to Karlsson et al. (2012) the effects of entrepreneurship education is still poorly understood and few studies have evaluated entrepreneurship education and the ones which have has lacked pre-post tests and control groups. Karlsson et al. (2012) cited Webber, Graevenitz and Harhoff (2009), as there is a lack of longitudinal studies with control groups conducted. Karlsson et al. (2012) questioned raised the concern to what extent do entrepreneurship courses and programmes have actually support the development of entrepreneurial skills and abilities.

Measuring the impact of SPEED is not a straight forward process if the success is only measured by the number of new ventures started according to Corlett (2008), as the individual entrepreneurial attitudes are not considered. In previous years the SPEED Programme was evaluated by the Education and High Growth Innovation Group and looked at 200 participants who completed the pre and post questionnaire looking at the effectiveness of the programme (Corlett, 2008). The results highlighted that the participants had increased their capacity to start a new venture compared to their peers; however it had a small negative effect on the entrepreneurial intentions of the students (Cooper et al., 2007). This negative effect could be due to a greater awareness of the challenges and problems which you might face when starting a venture (Cooper et al., 2007). Corlett (2008) also mentioned that SPEED is a learning experience, "where business failure is as valuable as success" however many success businesses have been created from the programme.

The research completed by Karlsson et al. (2012) also agreed with Cooper et al. (2007) as they stated entrepreneurship education may improves the students' confidence to engage in entrepreneurial activities. This is supported by research conducted by Von Graevenitz (2010) cited in the BIS (2013) report where students who participated in a compulsory course as a part of their undergraduate degree programme in Germany demonstrated significant increase in their self-confidence and skills in business planning.

The 2012 SPEED WM Programme was evaluated by Bowes et al. (2012) and through the project 155 businesses and nearly 400 full time equivalent jobs were created for the region and the programme "has successfully nurtured local talent and injected fresh ideas to the region" (Bowes et al., 2012). Bowes et al. (2012) further claimed that this has also reduced the number of unemployed graduates and potentially increased the graduate retention rate for West Midlands.

The current programme, SPEED Plus which is part funded through ERDF will run until 2015, and have five partner universities with the West Midlands including Birmingham City University, Coventry University, Keele University, Staffordshire University and the University of Wolverhampton (SPEED Plus, 2013). There are similar business start up programmes such as 'Enterprise Inc' and 'Grads Up North'. Enterprise Inc was formed as a spin out programme of the original SPEED programme in 2008 with a consortium of 9 East Midlands universities when the regional development agencies was disbanded, however the current Enterprise Inc programme only supports final year students alongside recent graduates (Enterprise Inc.,

2013). The Graduate Entrepreneurship Project which can be referred to 'Grads Up North' project brings together 10 HEI from Yorkshire and Humber to focus on enterprise and entrepreneurship which includes specific business start-up advice, proof-of-concept funding along with start-up grants (Graduate Entrepreneurship 2014). As with SPEED Plus, the programmes are ERDF co-funded projects with outputs including businesses and jobs created for the respected regions (Enterprise Inc., 2013).

Entrepreneurial Characteristics

The characteristics of entrepreneurial individuals have been well researched over the last century, with a clear eleven characteristics being hypothesized and supported in a number of key academic texts. Koh and Ho (1992) suggest five key characteristics that have been shown to found in entrepreneurial individuals which include, need for achievement, locus of control, propensity to take risks, tolerance to ambiguity and self confidence. In addition to this, a number of other characteristics have been associated with the entrepreneurial mindset which includes, creativity, ability to take action, leadership, opportunity spotting and independence (Gasse, 1996). The following points will look to give an overview of these characteristics and highlight the key literature that supports each.

Internal Locus of Control is one of the key characteristics that was initially suggested and discussed in detail by Rotter (1966). Rotter suggested that an individual can position themselves upon a scale between Internal and External Locus of control. The closer an individual to internal locus of control, the more confident the individual is towards having the ability to be proactive towards a situation and alter scenarios; whereas an individual that is closer to the external locus of control scale, shows more reactive tendencies and feels that situations and others influence their life rather than their own actions and decisions. It has also been suggested that depending on an individuals placement on the scale of locus of control, their level of entrepreneurial success can be distinguished; irrespective of their other characteristics (Brockhaus and Horwitz, 1986).

Having an inclination to lead groups of all sizes is often a characteristic seen within entrepreneurial individuals, as it is rare that a business can operate as without interaction with others (as even sole traders will often deal with multiple suppliers, customers and stake holders). Therefore Leadership becomes an integral part of the entrepreneurial characteristic set that can be found within the literature. This desire to lead others has a number of interlinking connections with other characteristics, as for example without an internal locus of control; it would be unlikely that an individual would see purpose in leading a team (Begley and Boyd, 1988).

An individual's tolerance for ambiguity or ability to handle stressful and uncertain situations, looks to put a level at which an individual can tolerate new and/or complex situations that may cause fear and uncertainty. Entrepreneurship is often seen as breaking into unknown territory, however inevitably this is not a characteristics that only business based entrepreneurs possess. As business operations are often an area that looks at new problems and solutions regularly, Jonassen and Grabowski (1993) suggest that those that can deal with these ambiguous scenarios may be more effective entrepreneurs, often leading to further successes. It has also been highlighted that entrepreneurs not only operate effectively in uncertain situations but they actively seek out these situations, as they know this is often a place with more opportunities that are missed by those unwilling to face the ambiguity (Mitton, 1989).

An individual's confidence (also referred to self efficacy) in their own abilities and knowledge to progress through a scenario has been highlighted by many scholars in the field as being fundamental to entrepreneurship (Caird, 1991). Within day to day operations of any business, whether that is large or small, there will be requirements for an entrepreneur to be self confident, both internally and externally. Firstly an internal self confidence is needed to drive them forward in the belief that they are capable of taking the vision of a business in their mind forward to become a prosperous enterprise; despite the overwhelming statistics of business failure. The external element of this self confidence is shown to customers, employees and other stake holders that give them confidence within the business also.

Throughout the literature upon entrepreneurial characteristics that are at the forefront of the measurement process, an individual's need for achievement has a propensity to be high with entrepreneurial characters. McCelland (1987) discusses this characteristic as being one held by many successful individuals within the business environment, however not restricted to businesses alone. A person's need for achievement is considered to be their motivation towards reaching the various goals and successes, although these do depend upon each individual's definition of success (Sagie and Elizur, 1999). This need to make successes of situations increases the propensity to which an individual is likely to create a business, especially as there are often a high number of problems and goals made in the process of setting up and running a business. Johnsons (1990) work associating individuals need for achievement with the over arching set of

characteristics that make an individual entrepreneurial saw a majority of studies putting need for achievement as an entrepreneurial tendency, with 20 of 23 studies highlighting the connection.

Being a creative individual is not always considered to be a fundamental element of the entrepreneurial persona (Lee et al., 2004), however it is often seen in many successful entrepreneurial individuals. Being able to perceive new solutions to problems, through deconstructing issues and reconfiguring the component parts has led to a number of revolutionary ideas throughout history, which have often led to substantial success from the invention of the telephone to today's mobile apps. The ability for entrepreneurial individuals to be creative has arguably given the global market some of its greatest technological and business achievements from the internet to the uprising of social media; which despite not making huge leaps in technological progress is giving millions of consumers the solutions they want (Neck and Greene, 2011).

Individuals that can think and talk about what they could or should do are many in number, however some individuals that have a high action orientation, are those that take steps to turn plans and ideas into reality. An effective entrepreneurial individual has the ability to not only come up with ideas through creativity, but also to implement those ideas and make steps forward to create change. This change could take a number of forms, but within the entrepreneurial discussion, financial and employment are often key metrics, although with the rise of social enterprises there are far more successful measures in the global business realm than there has been in the past (Obrecht, 2004).

The ability of someone to take or avoid risks, has been highlighted as core reason for success or failure within a project. Littunen (2000) discusses the difference between entrepreneurs and other control groups, in that entrepreneurs often risk their own assets, however in the current economic climate those in employment often need to take risks in order to remain in employment. It was suggested by Mill (1973) that an individual's ability to take upon risks is the differentiating characteristic between managers and entrepreneurs, as entrepreneurs often take upon higher risks, often with risk of both, their own assets and those of others. Despite it being a characteristic that gained popularity in the later stages of the twentieth century (unlike locus of control), it has become a fundamental part of the characteristic set that are considered to make a person entrepreneurial (Cunningham and Lischeron, 1991; Ho and Koh, 1992).

As a psychological characteristic, perseverance has been well researched; with its origins found in Clark (1935). Yet this is not to say that humans have not been persevering since the evolution of man. Its been suggested that those individuals with high levels of perseverance are able to look to the overall conclusion of a task and use this image a motivator despite the problems that may be faced on the journey (Eisenberger 1992). Markham et al. (2005) further discusses the importance of perseverance to entrepreneurial projects, due to the potential for adversity and ambiguity that may be faced.
A person's perception of a task and its complexity will be impacted by a number of elements from gender to academic achievement, amongst other influences; these factors will define whether the initial steps are taken towards the goal (Stoltz, 1997).

A key characteristic that is often associated with the personality of an entrepreneurial individual is that of opportunity recognition (Stephenson, 1985). Furthermore the ability of the entrepreneurial individual to recognize opportunities and act upon them, often sets apart entrepreneurial individuals and individuals in managerial posts. Being active in an environment would suggest that all individuals would be able to identify opportunities, yet there are often few that are open to this problem and solution situation that can often be right in front of them. Despite this characteristic seeming to be relatively simplistic, there is debate within the literature as to varying degrees of complexity of recognizing these situation and how entrepreneurial react to them (Bhave, 1994; Schwatz & Teach, 1999; Singh et al., 1999; De Koning, 1999; Sigrist, 1999)

The final characteristic that appears in number of academic texts is independence. An individuals need for flexibility and freedom in both their private and work lives, has an attractive quality to it, however it is more important to some than it is to others. Successful entrepreneur Karren Brady, states:

> "*The goal I have been striving to reach all my life is independence. More than money, fame or glamour I have always been driven by that desire: to live a life where no one can ever tell me what to do… I've always been this way. I still am"* Brady (2012)

Bolton & Thomson (2013) further suggest that given an overview of the literature and active surveys into entrepreneurs, a need for independence is often found to be their primary motivator. Although not always given quite as big a role in the making of an entrepreneur, Hornaday (1982) included it within a set of forty-two characteristics.

These eleven key characteristics have all been associated with the entrepreneurial personality. To take this research further a framework set out by Gasse (2006) will be assessed for suitability in measuring the different aspects of the SPEED students personalities on entering and exiting the project, whilst comparing these a control group of mixed students not engaged in any way with entrepreneurship (education, self-employment, etc).

Methodology

To investigate the impact for the SPEED Plus project which included the two day residential of workshops, access to a business consultant for 12 hours, and the weekly master classes (10 in total) a repeat of the same questionnaire was used to measure the impact of these over the 6 months programme. The questionnaire was administrated at the start of the programme, but after the students were accepted to the scheme (but before any direct start up activities had started) and the exit questionnaire was completed after the student had their exit interview with the project team from the University. Like before a forced 4 point Likert scale was used to determine scale of benefit to the participant (1 represented not beneficial at all and 4 represented very beneficial).The entry questionnaire also investigated the motivations of why they had selected now to start a business along with demographic information.

In order to monitor consistently the specific entrepreneurial characteristics discussed within the literature highlighted in the previous section, a thirty three question survey was developed. The survey was modelled upon the work of Gasse (1996), using neutral statements that related to one of the eleven characteristics. By using this pre-validated methodology to model this research tool, enabled the flexibility to monitor a broad selection of entrepreneurial characteristics discussed by academics in the field, as well as yield valid results.

Each statement was followed by a four point Forced Likert Scale that forces respondents to make a judgement as to whether they agree or disagree with the statement. This technique has been chosen as it is the base of Gasse's (1996) methodology, as well as ethically each statement allows for a logical response to be provided on each section without causing confusion.

To ensure that each statement gave respondents a full and clear understanding of what was being asked of them; all statements went through the full ethics procedure as is mandatory with all research projects originating from Coventry University.

As previously mentioned by Karlsson et al. (2012), the lack of control groups have been highlighted. To overcome this lack of research, control groups will be established of Coventry University students through the two cohorts at similar times to be used as a comparison; adding another dimension to the research. A further step taken towards testing the reliability of this methodology, a pilot study was undertaken revealing the tool identified a statistical difference between the characteristics of those who had and had not previously ran a business.

Results

The results to investigate the profile and motivations of the 30 students which completed the pre and post exit questionnaire during 2014 are stated below with the questions and overall results gained from respondents:

Before the participant formally started on the programme (Pre-Speed)

1. Age: Mean average was 26.33 years old, with the range from 19 to 45. 16 of the participant were 23 years old or older at start of the programme, highlighting that the majority were non-traditional recruited student, or that they started the programme after they had graduated.

2. Coventry University faculty

Art & Design	9
Business, Environment and Society	7
Engineering & Computing	5
Health & Life Sciences	9

   The participants came from a range of different courses and faculties

3. Do any of your immediate family members run a business?

No	18

Yes 12

With the participants highlighting, Aunts and Uncles, Siblings, parents and foster parents as family members. 3 of the participants highlighted that more than one close family member was running a business.

4. 10. Have you ever been involved in any Business or entrepreneurship/enterprise based education? (GCSE's, A Levels etc)

   Yes 9
   No 21

   This was fairly surprising for the authors, however could be due to higher average age of the student than expected. Business and enterprise related education programmes have become more popular in recent years so this could be one of the reasons.

5. Have you ever run your own business? (yes or No)

   No 22
   Yes 8

   Based on the higher than expected average age of the participants, it is fairly logical that some of the participants have run a business before.

6. What business sector are you in? (open ended text question)

   This response was very varied with no clear groupings of the sectors. The sectors which were highlighted by the participant include: Art & Design, creative, Entertainment, Fashion, Music entertainment, Mental health, photography, publishing and recruitment.

7. What motivated you to apply for SPEED Plus?

   This question was an open end, with the results analysed by the research team through quantifiable "key words from the respondents. From the responses a max of two key words were provided with some of the participants not stating a response. The themes obtained were, Knowledge, Support, Consultancy, Own Success, Be your boss, Funding and to exploit an opportunity to name a few. 42 responses were collected with these being highlighted in the below table.

Motivation	**Quantity**
Knowledge	11
Support	9
Access to Consultancy	8
Own Success	5
Be my own Boss	3
Funding	2
Exploit an Opportunity	1
Gain Experience	1
Network	1
Resources	1

The main findings from the results show that the participants were motivated mainly by the knowledge and support which the programme offers. Consultancy was also high on the list, along with the personal motivation of wanting to be "their own boss". The researchers thought funding would be higher up the list based on the research conducted by Woodier (2010). One reason why this could have been different is that the participant might not have wanted to declare this was their motivation at the start, even though the questionnaire distribution was completely separate from the project management team. The terminologies are also very vague with some of the keywords overlap in definition, so the authors suggest this data is to be used as an overview.

8. Why did you make the decision to pursue your business idea now?

   Similar to the above question, keywords were generated from the open ended questions. In total 37 keywords were generated and these are highlighted in the below table.

Decision	Quantity
Time is right	14
Just graduated	4
Graduated, what to work in my degree industry	3
Available time	2
Because I am young	2
Because of the programme	2
Ready for when I graduate	2

   There were additional responses with only one respondent, which include “Better career options”, “Financially able”, “Made redundant”, “Have Support”, “Market is ready” and “To gain experience”

   The majority of the respondents highlighted that the “Time is right”, however the reason why the time was right was not highlighted. Some of the other responses did highlight the reason such as “just graduated”, and “want to work in the industry” however the authors would like to explore this in the future.

In the following sections the results from the post SPEED are analysed

9. Have you started trading yet?

   17 out of the 30 students had started to trade, however all 30 of them have either registered as self-employed or limited through the programme. As the ranges of the businesses are extremely wide, the time to market and development time could be a factor for the businesses not all trading by now. When entering the programme the student’s ideas were also at a range of different stages.

10. Review of the business support provided through the programme. A four point Likert scale was used from, 1 – Not beneficial, 2 – Slightly Beneficial, 3 – Beneficial, 4 – Very Beneficial

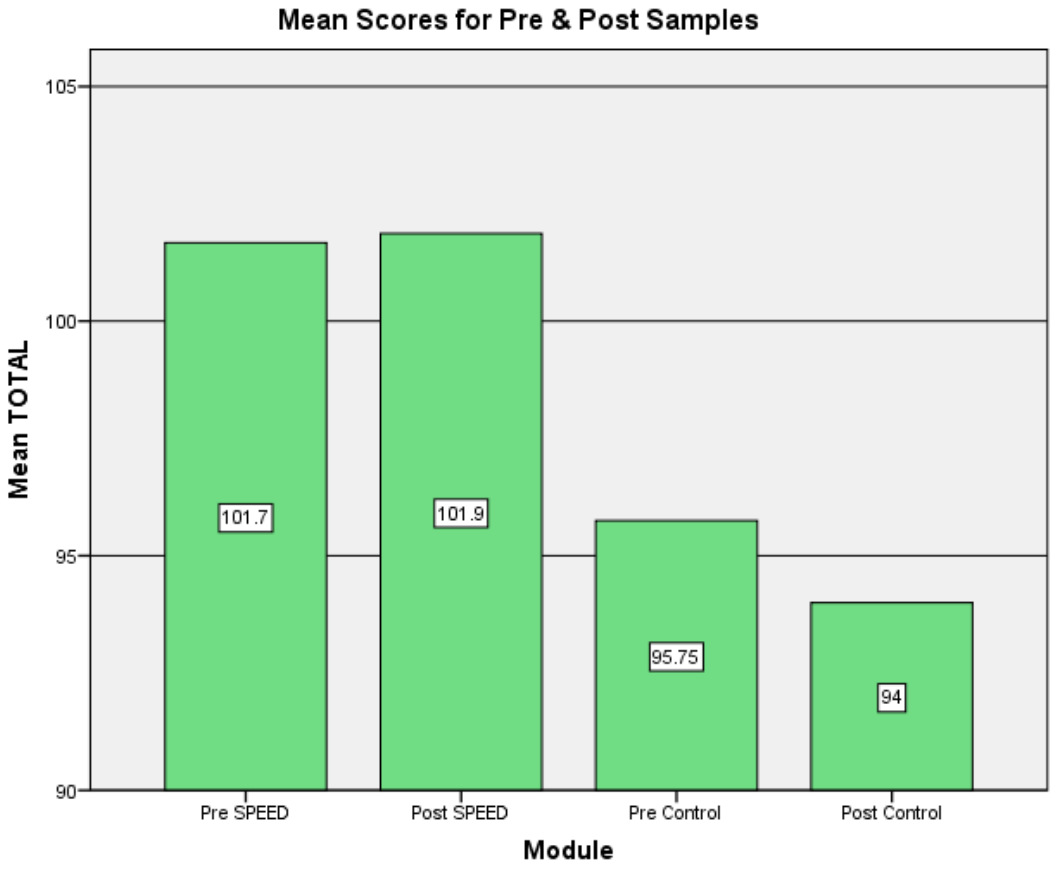
Question	Scale (Avg)
How beneficial was the residential?	3.47
How beneficial was the access to a business consultant for 12 hours?	3.90
How beneficial were the 10 business workshops on Wednesday afternoons?	2.83

    The results highlighted the overall positive benefit for the weekend residential, the use of the business consultant and the business workshops. The access to the business consultant was the most valuable according to the students with only 3 participants rating it to be beneficial rather than Very beneficial. The results from the workshops were less positive, however as previously highlighted 9 of the 30 participants had prior business or enterprise education and when these were removed from the data, the results increased to 3.05.

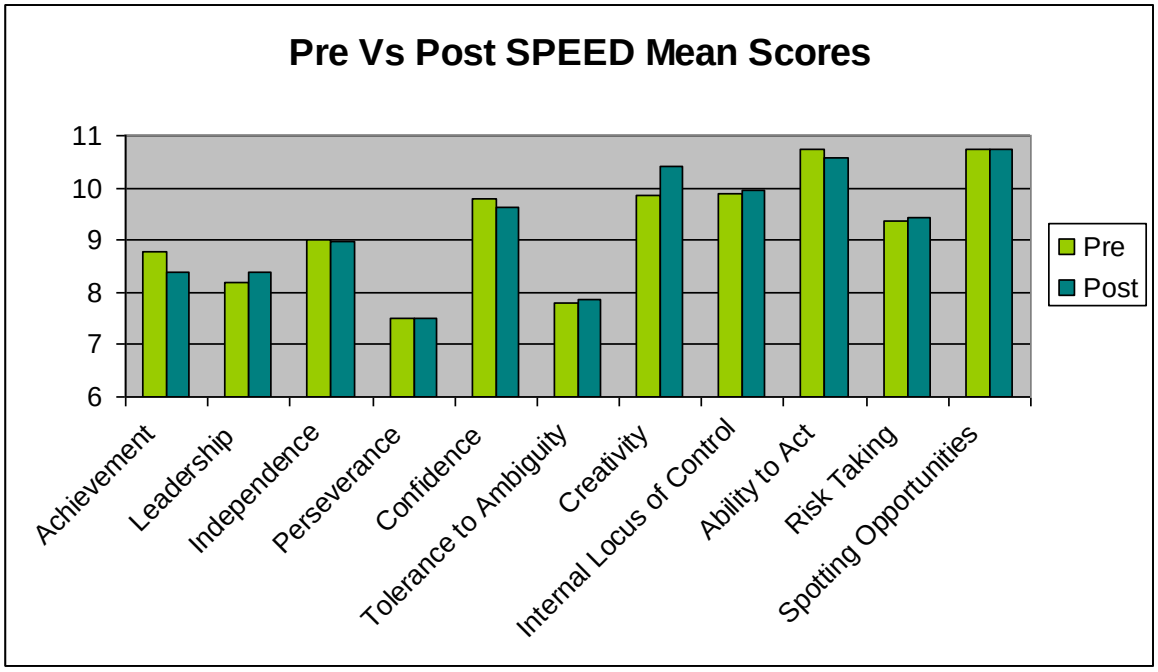
11. What are your current career intentions after SPEED Plus (After 6 months of the programme)

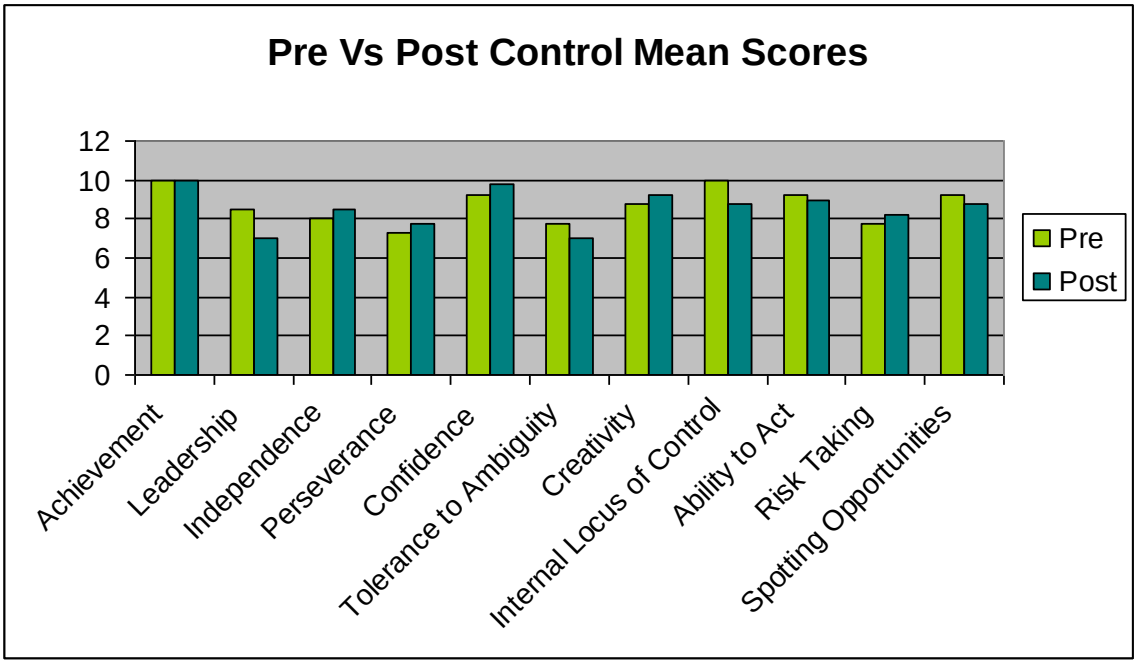
    Again, this was an open ended designed question. The majority of the respondents were going to continue to run and grow the business with this being alongside their studies or after graduation. Four participants stated that they will continue to work on the business alongside a full time graduate job with only two participants stating that were “going to get a job”. These results are very positive; however the participants are all in very different stages within their businesses and studies.

In order to evaluate the effects upon the entrepreneurial characteristics of the students undertaking the placement, the following graphs have been created to demonstrate the differences and correlations between the research participants. The initial graph highlights the mean scores gained from two different samples, the SPEED Plus students and a random sample of under-graduate students at Coventry University that had never before engaged in any enterprise based learning. Both samples completed the questionnaire at the start of the SPEED placement and on their exit, and these same time periods were used for the random sample.

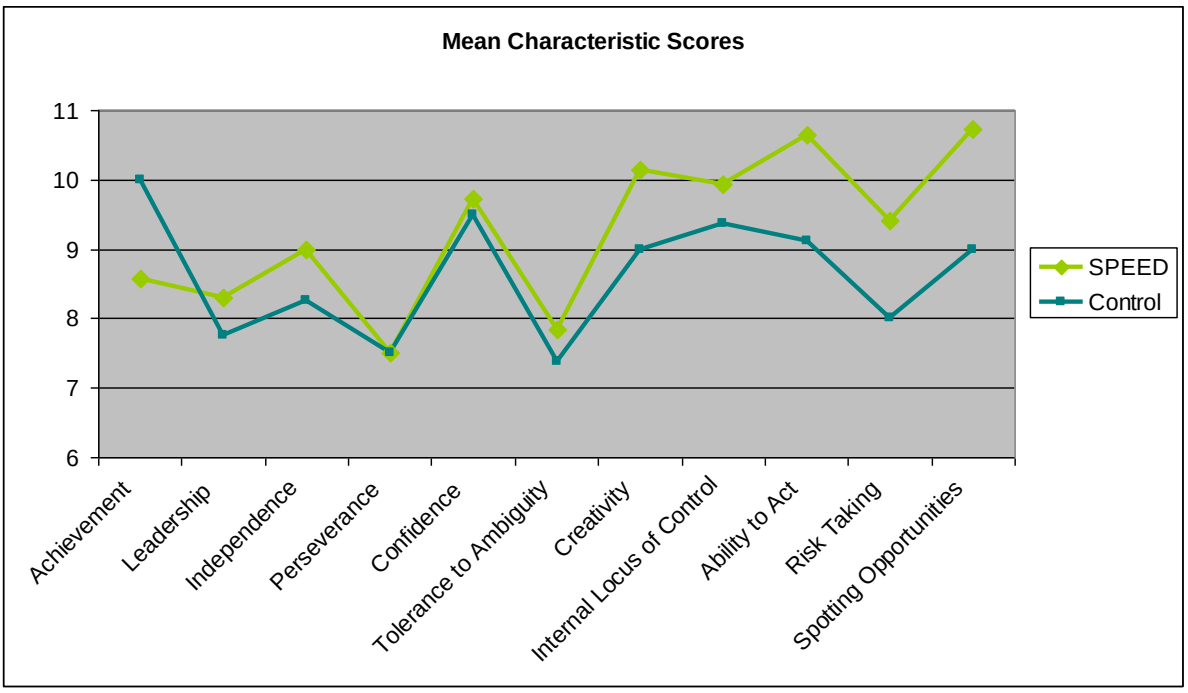


In order to break down each of the characteristics for each of the sample groups the below graphs have been generated. Within the SPEED group the greatest increase was in the creativity category showing an increase of 0.53 on the 3-12 scale. Whereas the control group greatest change was an increase of 0.5 in the perseverance characteristic.





The line graph below demonstrates the variances in mean scores across both the SPEED and Control samples, indicating that the SPEED group display higher levels of the characteristic set, than that of the Control group. However there is the exception of 'Need for Achievement' which is higher in the control group.



On review of the results from the two samples, there was a similar split between those respondents that increased, decreased or remained the same. Within the 30 SPEED sample, 15 students scores increased over the measurement period; whilst 13 of the scores decreased and 2 remained the same. The control sample on the other hand, had a 50/50 split between those respondents that increased and those that decreased over the same period of time. For further analysis of the differences between the two groups across the time period, the table below has been generated.

	Mean Pre	**Mean Post**	**Difference**
SPEED	101.67	101.87	0.2
Control Group	95.75	94	-1.75

The last question asked the participants if they had any additional comments, with the unexpected comments provided anonymously by some of the participants being:

> *"I think SPEED Plus is an exceptional opportunity to access help that would otherwise be up available to business start-ups. The SPEED Plus programme can be a stepping stone for any business that needs start up help and as such is invaluable"*

> *"I have sincerely enjoyed and benefited from the SPEED programme, the business training has completely changed how I now run my business and how I will be able to shape it in the future to grow and be successful. Thank you to everyone on the course who has supported me!"*

> *"I found the project very useful so thank you to everyone involved! I feel that I have more knowledge and more"*

> *"Highly recommend the SPEED+ programme."*

The positive impact which the programme has had on participants is clearly shown. The design and implementation of the programme by the SPEED Plus team is clear benefit and credit to the University's "Added value" nature to its offering.

Discussions

Following the lesson learnt from the initial pilot studies within this research, a greater understanding has been developed for impact of the SPEED project on its participants. The need to support the entrepreneurial students and graduates is clear within this study and supports the Wilson (2012), Kelly et al. (2012), BIS (2013:13) and Culkin (2013:636) that HEI play an important role in fostering enterprise amongst its students. As previously stated, businesses and jobs created are fairly easily quantifiable output of business start-up programmes, however the results also agree with Corlett (2008) as it is not a straight forward process in measuring the impact of these programmes.

The average age of the participant was surprising to the authors with the average age being 26. The programme saw several 'older' and 'mature' students being a part of the programme. These participants were of all three years of study with them bringing their previous life experience to the business. This could also be highlighted that 8 of the sample have also run a business before. The authors do feel that it is extremely important that the start-up programme are available to all student year level as it provides the students the opportunity to gain experience and knowledge before they graduate.

The main motivation from the participants was to gain additional knowledge from the programme which was encouraging, and this was reflected well with the positive feedback results for the weekend residential, workshops and Business consultancy. The consultancy support which they received was scored the highest with the mentor being able to further explore the business venture from the knowledge gained from the workshops. Some participants felt the workshops very not very beneficial however these were from enterprise or business degree courses.

The overall feedback of the programme on the learner was positive, however this does disagree with Cooper et al. (2007) as no or little negative effect on entrepreneurial intentions was shown within this study. The results do add to the further understanding of the impact of enterprise education programmes which was suggested by Karlsson et al. (2012) with the use of pre and post tests along with a control group. Karlsson et al (2012) also cited Webber, Graevenitz and Harhoff (2009) as there is a lack of longitudinal studies and this will be investigated with the design and implementation of future research plan to monitor this after 2 and 4 years.

The results of the characteristic measurement framework yielded supporting evidence for SPEED students having higher than average levels of the eleven characteristics measured, apart from need for achievement which gained a lower score than the control group. When compared to the average scores from the control group, it is suggested that there is a clear difference in characteristics position from those interested in starting a business and those who are not. These findings align well with a number of key researchers, including Kao (1992), Gasse (1996), Rotter (1966), McClelland (1987) and others.

Over the measurement period, the largest change shown by SPEED participants was a 0.53 increase in creativity. This suggests that during the students time on the programme and following, their levels of creativity in both their businesses and their studies are positively affected. Within their businesses this will enable them to generate new ideas in order to stay ahead of the competition. Whilst as a student, this increased creativity may enable students to alter the way they study which may positively influence their overall academic achievement. The authors were surprised that within the entrepreneurial characteristics questionnaire that the confidence actually decreased. This could be due to the additional knowledge which they have gained has led to a negative impact on entrepreneurial intent which Cooper et al. (2007) highlighted.

Limitations

Since the initial piloting of this study, a number of key lessons have been learnt as to the best practice to gain valid and reliable data, in order to answer the research questions. One of the initial limitations was a restricted number of participants, which was resolved with increased rigidity in the data collection process, taking the number of participants from 3 to 30. Yet a limiting factor that shall be addressed as this longitudinal study progresses, is the low number of control sample participants that completed both the entry and exit questionnaires.

The results between the pre and post questionnaire was very similar as previously mentioned: This could have due to the four point forced Likert scale which has not provided the participant the flexibility to be more selective with regards to the questions asked. Although this would be an option to enhance the data from the

research, on review of a number of psychometric approaches to entrepreneurial characteristic measurement, four point likert scales are regularly used, such as Hartman (1959).

The validity of the SPEED research questions could be questioned as the research was being conducted by Coventry University members of staff. To reduce the risk of the participants not providing the full details the participant information sheet clearly stated that the research project was separate from the management team, and that all of the published information will be anonymised.

The use of the sample was highlighted by Karlsson et al. (2012), however the control group size was only 4. For future studies the authors would like to improve the reliability of the results with the participants coming from a sample representation of the university students at Coventry University.

Conclusion

There have been a number of key findings found throughout this research, however as with most other academic research, there are further steps to be taken. The data suggests that the students participating in the SPEED Plus programme display higher levels of entrepreneurial characteristics and overall these characteristics do increase over the programme, although this is minor. Therefore the output of the programme is to not only get businesses started and generate jobs across the West Midlands, but also change the characteristics of individuals to potential impact upon their future career whether that is in starting businesses or contributing to other businesses and organisations in the future. The study also highlights that start up programmes can play a vital role in creating sustainable businesses with all 30 of the post questionnaire sample continuing to run their businesses in some way after the completion of the scheme. However the design of future cross regional, consortium designed programmes which is partial funded through the ERDF could be problematic going forward with the creation of the Local Enterprise Partnership (LEP) as agreement across the LEPs will be required for these to be implemented.

Further Research

Based on the positive feedback gained from the participants, further research will be planned to continue to monitor the success of the SPEED Plus programme for future cohorts for the benefit of both the students and the university. The authors would like to further investigation other HEI start up programmes such as Grads Up North and Enterprise Inc which have been previously mentioned in the report.

With the range of various support programmes offered by Coventry University through the Institute of Applied Entrepreneurship, further review of the entrepreneurial intentions and characteristics is planned for the Tier 1 Graduate Entrepreneurship Visa, and the Erasmus for young entrepreneurs projects to further aid the understanding of the “needs and demands (wants)” of entrepreneurs of the future.

References

Atherton J, S. (2013) *Learning and Teaching; Action Learning* [online] available from http://www.learningandteaching.info/teaching/action_learning.htm [6th June 2014]

BERR (2008), "Enterprise: unlocking the UK's talent", Department of Business, Enterprise and Regulatory Reform, London, [online] available from www.berr.gov.uk/files/file44992.pdf [12th June 2014]

Bhave, M. P. (1994) 'A Process Model of Entrepreneurial Venture Creation'. *Journal of Business Venturing* 9 (3), 223-242

Bowes, L. Howe, P. Hughes, T. Nixon, I (2012) *Evaluation of the SPEED WM Programme: Final Report May 2012*, CFE,

Birch, C. Clement, B. (2006), *Creating graduate entrepreneurship through self-employed work placements – Project SPEED*, paper presented at ISBE, Cardiff.

Brady, K. (2012) 'Strong Woman: The Truth about Getting to the Top': HarperCollins UK

Brockhaus, R. H. Horwitz, P. (1986) *The Psychology of the Entrepreneur. 1996) Entrepreneurship: Critical Perspectives on Business and Management* 2, 260-283

Culkin, N (2013), *Beyond Being A Student: An Exploration of Student & Graduate Start-Up's (SGSU's) Operating From University Incubators*, Journal of Small Business and Enterprise development, vol 20, no. 3, pp. 634-639., 10.1108/JSBED-05-2013-0072

Corlett, D, Munro, J. and Cook, R. (2009*), The SPEED programme – enquiry based leaning as an extreme sport* [online] available from http://www.emeraldinsight.com/journals.htm?issn=0040-0912&volume=52&issue=6&articleid=1881749&show=pdf&PHPSESSID=f83gvgufchgbtr35uu09n3tjh4 [14th April 2013]

Cooper, Daly and Good, (2009) *SPEED Final Evaluation Report*, EHGI, Cambridge MIT Institute

Cunningham, J. B. Lischeron, J. (1991) *Defining Entrepreneurship. Journal of Small Business Management* 29 (1), 45-61

De Koning, A. and Muzyka, D. (1999) 'Conceptualizing Opportunity Recognition as a Socio-Cognitive Process'. *Centre for Advanced Studies in Leadership, Stockholm*

Edmonstrate (2003) *Defining action learning: what is it and what is it for?* [online] available from https://www.ashgate.com/pdf/SamplePages/actlearnch1.pdf

Enterprise Inc (2013) *Eligibility for the Enterprise Inc programme* [online] available from http://www.enterpriseinc.co.uk/eligibility.html

European Commission (2006), "Implementing the Community Lisbon Programme: fostering entrepreneurial mindsets through education and learning", [online] available from http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri¼COM:2006:0033:FIN:en:PDF [13thJune 2014

European Commission (2008), "Entrepreneurship in higher education, especially in non-business studies: report of the Expert Group", available at: http://ec.europa.eu/enterprise/policies/sme/files/support_measures/training_education/entr_highed_en.pdf [13th June 2014]

Gasse, Y. (1996*) 'Entrepreneurial Characteristics Inventory: Validation Process of an Instrument of Entrepreneurial Profiles (Summary)'. Frontiers in Entrepreneurship Research 1996*

GEM (2013) *Global Entrepreneurship Monitor UK 2012 Report* [online] available from http://www.gemconsortium.org/docs/3313/gem-uk-2012-report [13th June 2014]

GEM (2014) *Global Entrepreneurship Monitor UK 2013 Report* [online] available from http://www.gemconsortium.org/docs/3371/gem-uk-2013-report [5th July 2014]

Gibb, A. A. and Hannon, P. (2006) *Towards the entrepreneurial university?, International Journal of Entrepreneurship Education,* Vol. 4, pp. 73-110.

Gürol, Y. and Atsan, N. (2006) *'Entrepreneurial Characteristics Amongst University Students: Some Insights for Entrepreneurship Education and Training in Turkey'. Education Training* 48 (1), 25-38

Graduate Entrepreneurship (2014) About the Graduate Entrepreneurship Project [online] available from http://graduateentrepreneurship.co.uk/about/ [14th June 2014]

Ho, T. and Koh, H. (1992) *Differences in Psychological Characteristics between Entrepreneurially Inclined and Non-Entrepreneurially Inclined Accounting Graduates in Singapore.* Entrepreneurship, Innovation and Change: An International Journal 1 (11), 243-254

HESA (2013) HE Business Community Interaction – Over 3,500 new graduate start-ups in 2012/13 [online] available from https://www.hesa.ac.uk/pr202

Johnson, B. R. (1990) 'Toward a Multidimensional Model of Entrepreneurship: The Case of Achievement Motivation and the Entrepreneur'*. Entrepreneurship Theory and Practice* 14 (3), 39-54

Jonassen, D. H. and Grabowski, B. L. (2012) *Handbook of Individual Differences Learning and Instruction*.: Routledge

Kelly, S. Beasley, M (2011) *Graduate entrepreneurs: intentions, barriers and solutions*, Education + Training Vol. 53 No. 8/9, Emerald Group Publishing Limited

Littunen, H. (2000) *'Entrepreneurship and the Characteristics of the Entrepreneurial Personality'. International Journal of Entrepreneurial Behaviour & Research* 6 (6), 295-310

McClelland, D. C. (1987) *'Characteristics of Successful Entrepreneurs'. The Journal of Creative Behaviour* 21 (3), 219-233

Mill, J. (1873) 'Principles of Political Economy: With some of their Applications to Social Philosophy'

Mitton, D. G. (1989) 'The Complete Entrepreneur'*. Entrepreneurship Theory and Practice* 13 (3), 9-19

Neck, H. M. and Greene, P. G. (2011) 'Entrepreneurship Education: Known Worlds and New Frontiers'*. Journal of Small Business Management* 49 (1), 55-70

Obrecht, J. (2004) '14 Entrepreneurial Capabilities: A Resource-Based Systemic Approach to International Entrepreneurship'*. Handbook of Research on International Entrepreneurship*, 248

Rae, D. (2009) *Connecting entrepreneurial and action learning in student-initiated new business ventures: the case of SPEED*, Action Learning: Research and Practice, vol.6, no.3, pp.289-303. "

Rothaermel, F. and Thursby, M. (2005), *University-incubator firm knowledge flows: assessing their impact on incubator firm performance, Research Policy,* Vol. 34 No. 3, pp. 305-24.

Rotter, J. B. (1966) *'Generalized Expectancies for Internal Versus External Control of Reinforcement*.'*. Psychological Monographs: General and Applied* 80 (1), 1

Sagie, A. and Elizur, D. (1999) *'Achievement Motive and Entrepreneurial Orientation: A Structural Analysis'. Journal of Organizational Behavior* 20 (3), 375-387

Sigrist, B. (ed.) (1999) *A Presentation at the Annual UIC/AMA Symposium at Marketing/Entrepreneurship Interface, Sofia-Antipolis, France*. 'Entrepreneurial Opportunity Recognition'

Singh, R. P., Hills, G. E., Lumpkin, G., and Hybels, R. C. (eds.) (1999) *Academy of Management Proceedings*. 'The Entrepreneurial Opportunity Recognition Process: Examining the Role of Self-Perceived Alertness and Social Networks.': Academy of Management

SPEED Plus (2013) *About the SPEED Plus Project* [online] available from http://www.speed-plus.org/data-page/?PID=2 [7th September 2013]

Woodier-Harris, N. (2010) *Evaluating the impact of SPEED on students' career choices: a pilot study*, Education + Training, Vol. 52 Iss: 6/7, pp.463 – 476

Wilson, T. (2012) *A Review of Business – University Collaboration* [online] available from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32383/12-610-wilson-review-business-university-collaboration.pdf [16th April 2013]

Young, L (2013) Growing Your Business [online] available from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/198165/growing-your-business-lord-young.pdf

Young, L. (2014) *Enterprise for all* [online] available from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/321259/EnterpriseforAll-lowres-170614.pdf